Artificial Intelligence■Enabled Sensing Technologies in the 5G/Internet of Things Era: From Virtual Reality/Augmented Reality to the Digital Twin

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Abstract

With the development of 5G and Internet of Things (IoT), the era of big data■driven product design is booming. In addition, artificial intelligence (AI) is also emerging and evolving by recent breakthroughs in computing power and software architectures. In this regard, the digital twin, analyzing various sensor data with the help of AI algorithms, has become a cutting■edge technology that connects the physical and virtual worlds, in which the various sensors are highly desirable to collect environmental information. However, although existing sensor technologies, including cameras, microphones, inertial measurement units, etc., are widely used as sensing elements for various applications, high■power consumption and battery replacement of them is still a problem. Triboelectric nanogenerators (TENGs) as self■powered sensors supply a feasible platform for realizing self■sustainable and low■power systems. Herein, the recent progress on TENG■based intelligent systems, that is, wearable electronics, robot■related systems, and smart homes, followed by prospective future development enabled by sensor fusion technology, is focused on. Finally, how to apply artificial intelligence to the design of intelligent sensor systems for the 5G and IoT era is discussed.